First Meaningful Paint - manual evaluation

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Status: Deprecated, see bit.ly/ttfmp-doc

Background

Chrome loading team is trying to define one or a few metrics that matches user-perceived page loading performance. As a starting point, I evaluated how FirstTextPaint works well as an indication of meaningful paint.

Summary

- URL list:
  https://github.com/WPO-Foundation/webpagetest/blob/master/bulktest/alexa-curated.txt
  (used top 200 URLs)
- Full results: https://goo.gl/M0R8t9

count	%	description
146	73%	Good, FirstTextPaint was meaningful
8	4%	Splash screen / spinner
29	15%	Page header only
11	6%	Not meaningful, (almost) background only
5	3%	N/A (FirstTextPaint not recorded for some reason)

The next section showcases some representative pages for each of the cases.

Common failure modes

Page header only (15%)

In 15% of the pages, only page headers (logo, navigation bar, search box, etc.) are visible at the point of first text paint.
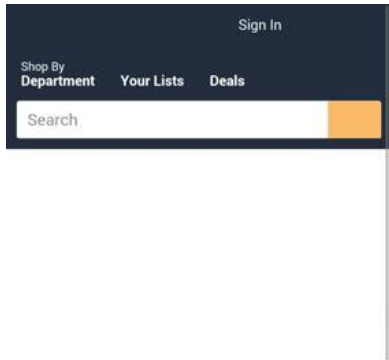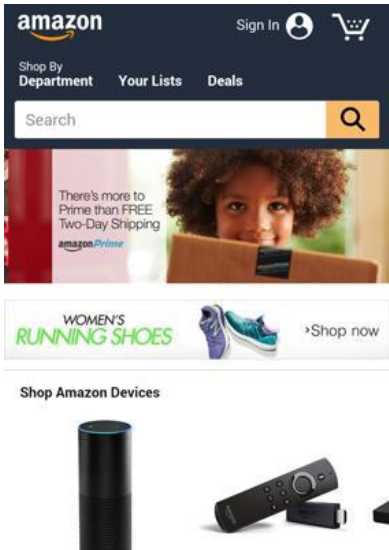
144. http://www.pconline.com.cn/

First Paint = First Text	Final State
7.143s	22.204s

3. http://allegro.pl/

First Paint = First Text	Final State
3.02s	11.613s

71. http://www.amazon.com/

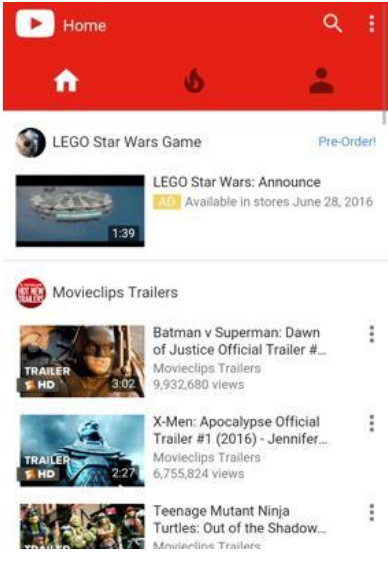| First Paint = First Text	Final State
2.274s	23.226s

Note the scroll bar in the first paint screenshot - we cannot detect header-only paint by just looking at page height.

Splash screen / spinner (4%)

Some page shows splash screen or loading indicator while loading actual contents in background.

194. http://www.youtube.com/

First Paint = First Text	Final State

YouTube Loading	
5.762s	8.743s

170. http://www.tmall.com/

First Paint = First Text	Final State
9.244s	37.715s

19.
http://feedly.com/#subscription%2Ffeed%2Fhttp%3A%2F%2Fwww.theverge.com%2Frss%2Ffull.xml

First Paint = First Text	Final State
feedly	feedly **Your work newsfeed** A single place for all the news, knowledge, and ideas you rely on to think, learn, and keep ahead. **Get feedly for Android** free ♥ Loved by 8,000,000 users
2.986s	9.19s

Not meaningful, (almost) background only (6%)

First painted texts are too small / trivial.

28. https://www.dropbox.com/
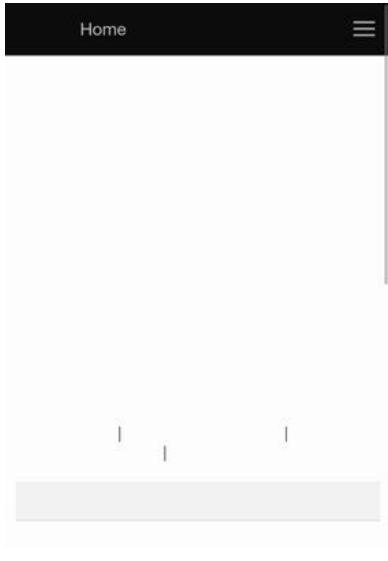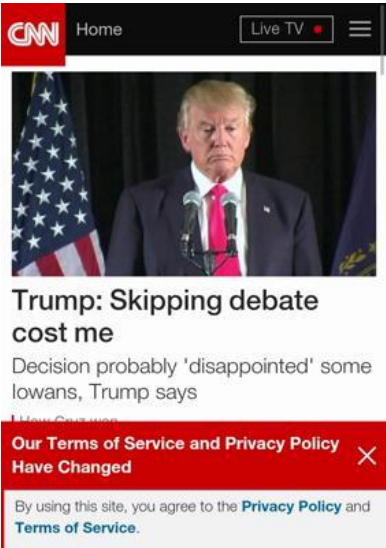
First Paint	First Text	Final State

3.517s	3.832s	5.977s

First text is small "or sign in" text below the blank button.

89. http://www.cnn.com/

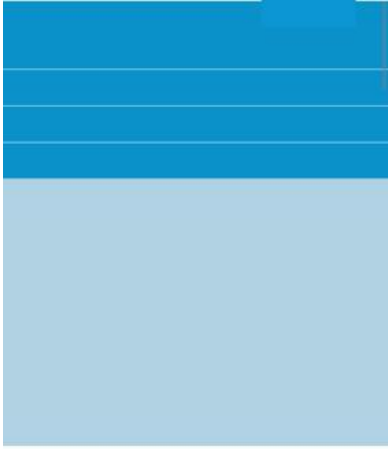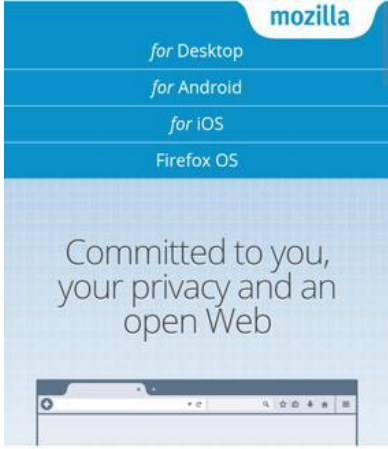| First Paint = First Text	Final State
7.057s	12.236s

WebFont for the header arrived first, while other fonts still loading.

First Text Paint was not visible

In 6% of the pages, there's no text seen in the screenshot at the point of FirstTextPaint. I investigated each cases and observed four patterns:

1. Text was out of viewport (6 pages)
2. Text was hidden by overlay element (3 pages)
3. Text was on a transparent layer (1 page)
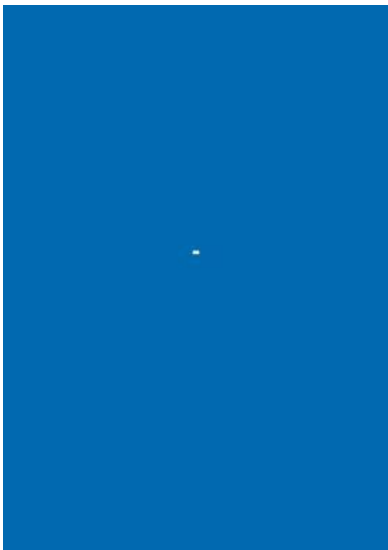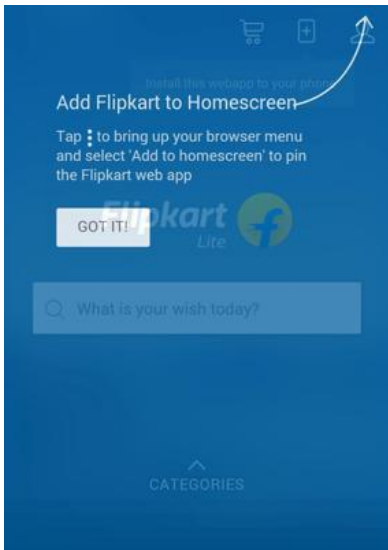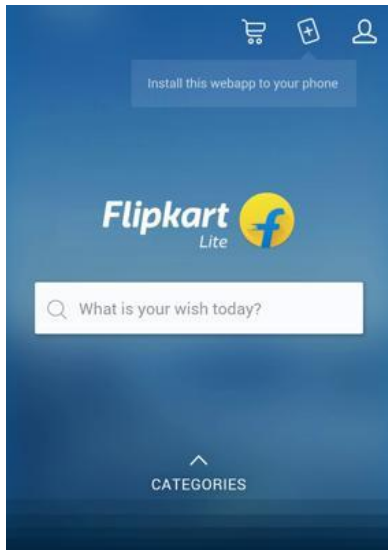4. font-size: 0px (1 page)

Text was out of viewport (34. https://www.mozilla.org/en-US/firefox/desktop/)

First Paint = First Text	First Visible Text	Final State
2.705s	4.228s	7.497s

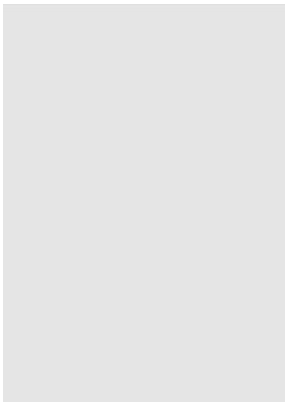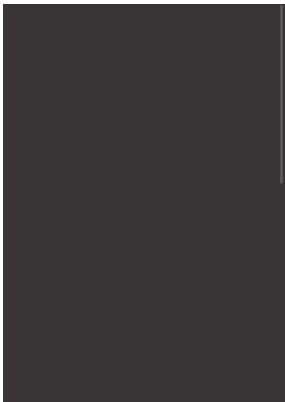The first painted text was "English", language selector at the bottom of the page (out of initial viewport).

Text was hidden by overlay element (104. http://www.flipkart.com/)

First Paint = First Text	First Visible Text	Final State

4.417s	9.853s	9.924s

First text was painted under the splash screen layer.
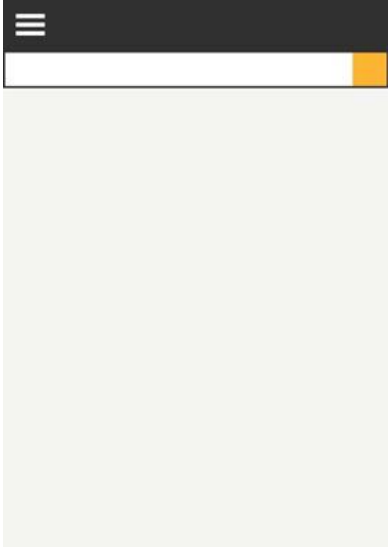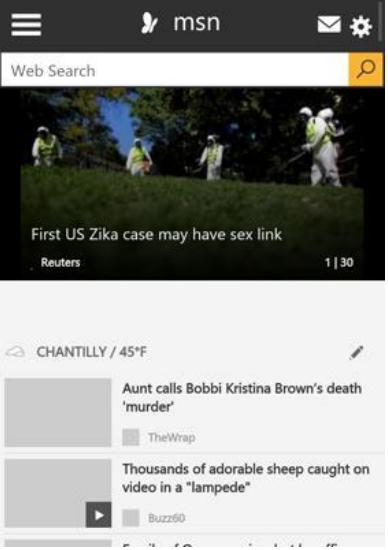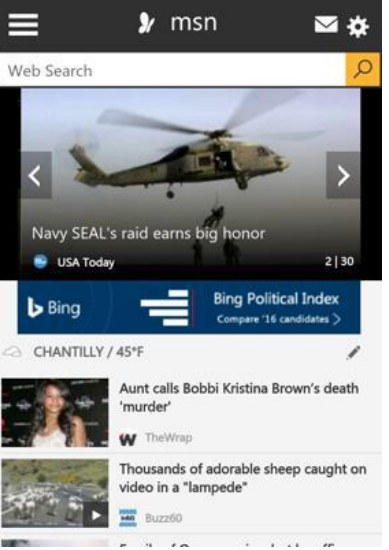
Text was on a transparent layer (67. http://www.adobe.com/)

First Paint	First Text	First Visible Text	Final State
8.99s	10.097s	44.403s	48.614s

The first painted text is "Lights. Camera. Mayhem.", but it's inside a transparent <main> element (opacity: 0).

font-size was 0px (135. http://www.msn.com/)

First Paint = First Text	First Visible Text	Final State

2.026s	4.152s	13.587s

The first painted text was "web search" on the search button (magnifying glass icon), which was not visible because of **font-size: 0px**. Accessibility / SEO purposes?

Discussions

- We might want to record multiple timings (for example time-to-splash-text/spinner and time-to-content-readable) and somehow combine them.
- Is it possible to detect header only or background only cases, by looking at the dom/layout tree and determining that a significant amount of content is not yet paintable (e.g. pending fonts / images)?
- How much work would it be to fix FirstTextPaint to only include visible text paints? The most common case was text painted out of the initial viewport.